

Between Pipelines and Electric Fences

10 Years of MT Measurements in the North German Basin

Bernhard Friedrichs (Metronix)

Norbert Hoffmann (BGR), Hartmut Joedike, Laska Horejschi (Uni Münster)

Data acquisition

Data consolidation

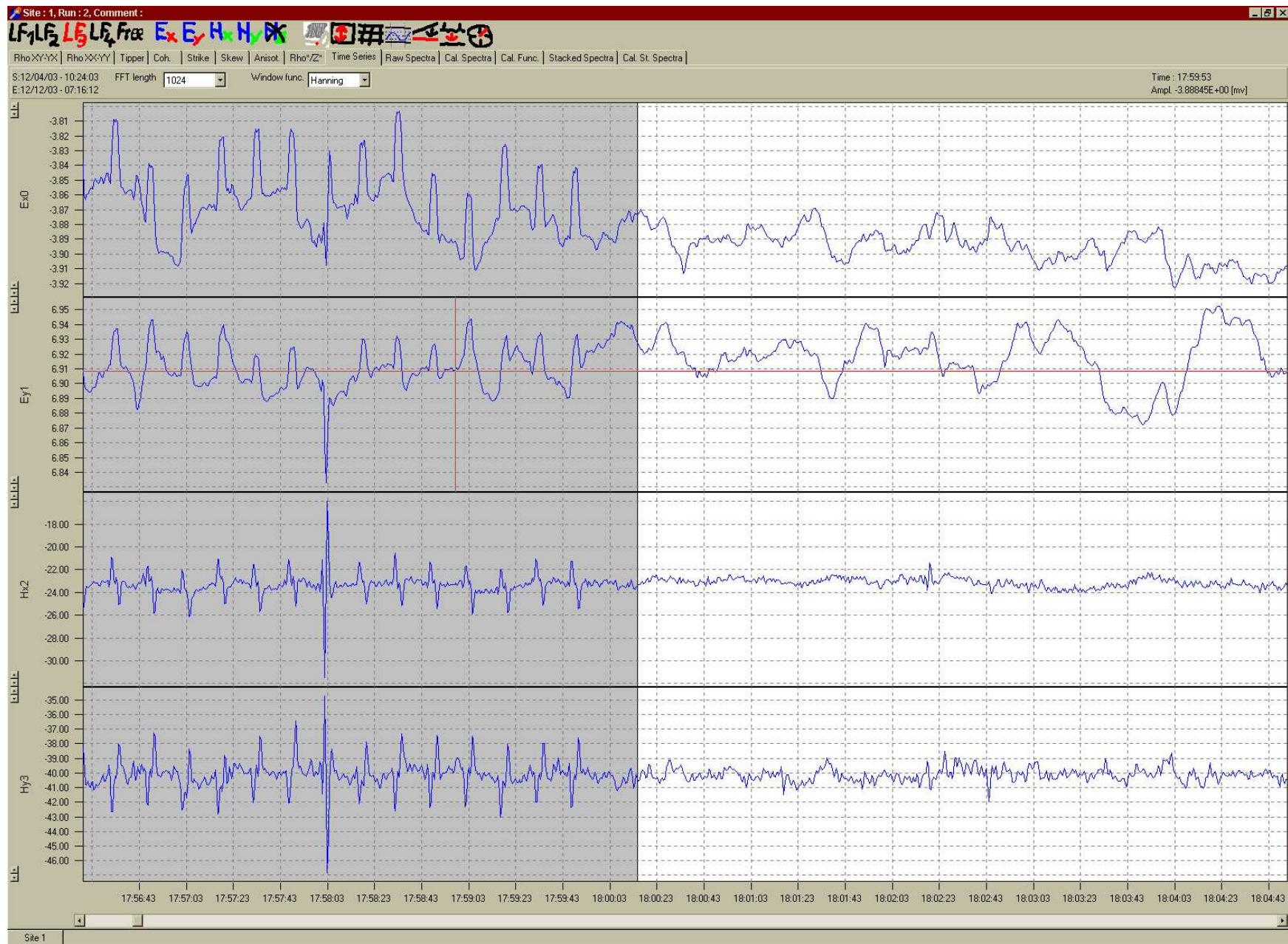
Data access

Data interpretation

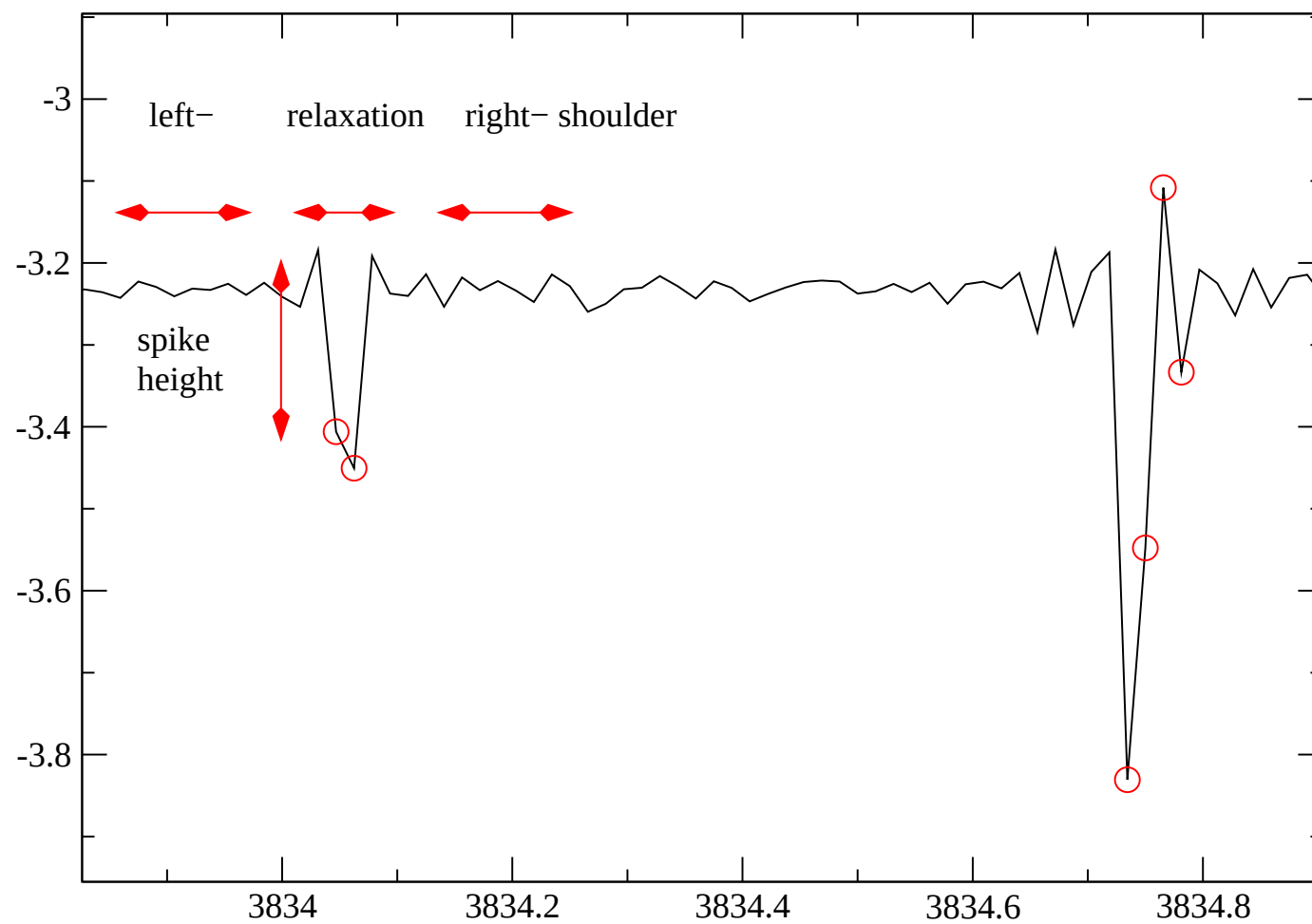
NE Germany



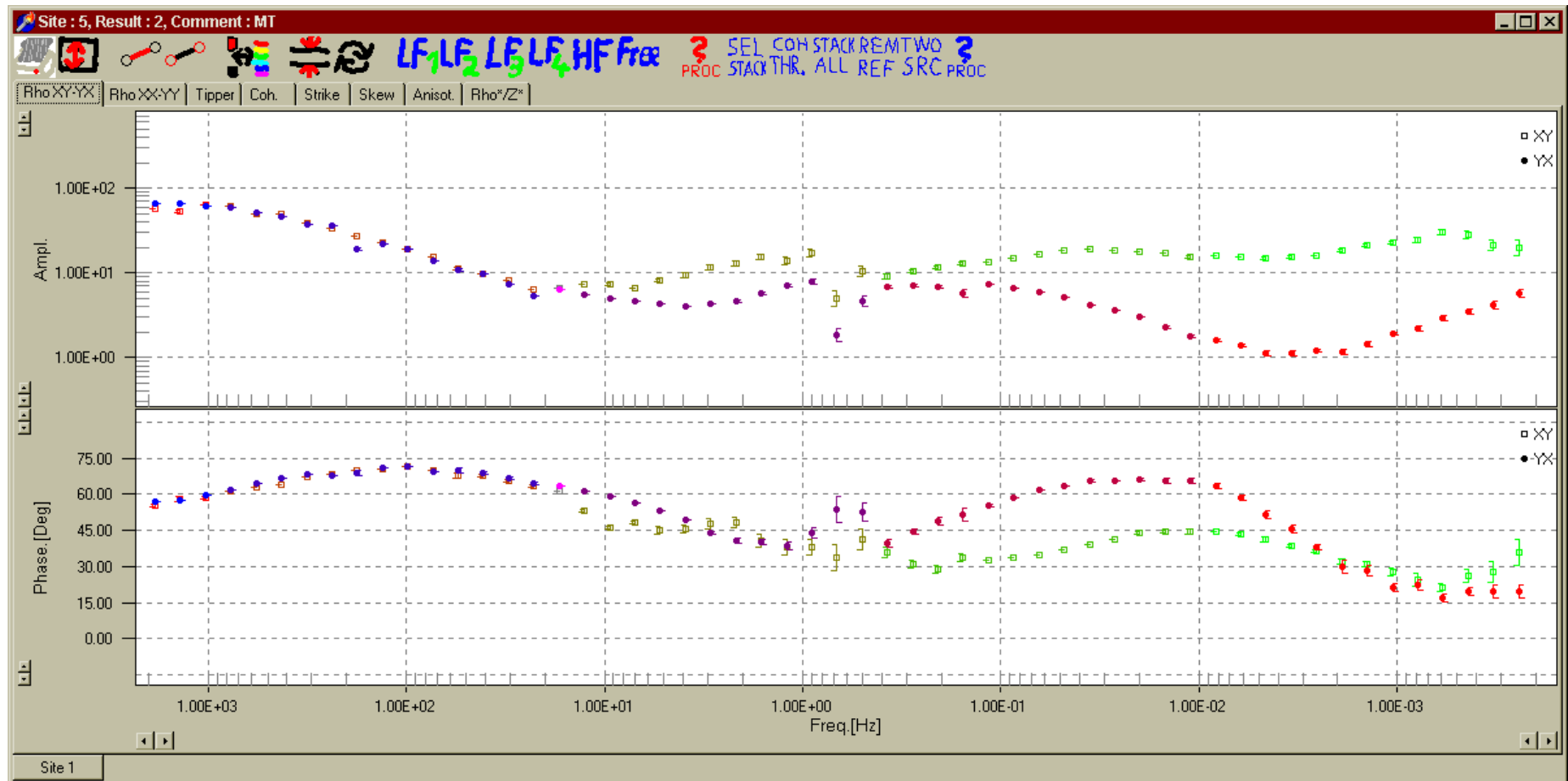
->



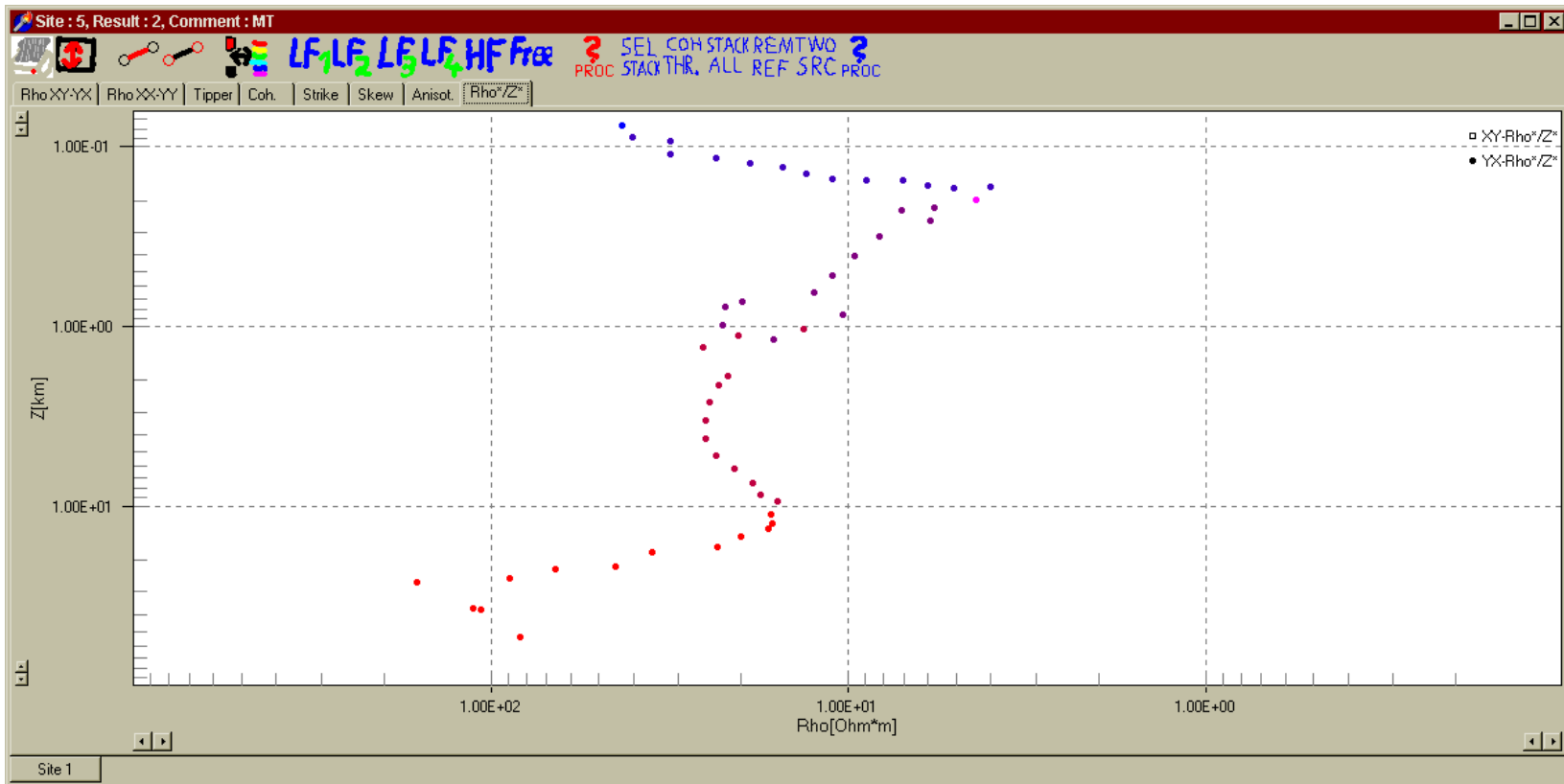
Despike II



Mühlenort $\rho_a - \varphi$



Mühlenort $\rho^* - z^*$



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Several generations of MT systems have been used:

- MMS-02e (1987) with KIM 879
- MMS-03e (1988) with KIM879, MFS-05
- GMS-05 (1991) with MFS-05
- GMS-06 (1998) with MFS-05, MFS-06

and different binary timeseries formats as well as for the transfer functions

- .02e format and “ung” format of Univ. Münster (non ISO, no coordinates)
- .03e format, “ung” and multi-site EDI format of BGR
(non ISO, no reference meridian and coordinate system)
- .rts format and standard EDI format (ISO)
- .ats format and standard EDI format (ISO)

Excursus Data Consolidation

Can we make a data format for all with XML?

Calibration by 3562A1996 10 18

Calibration by XXX File =XXX-9405.rsp

+++++.....-----.....-----.....-----.....

Unit is Volts/ Gamma

Freq Amp Phz

45 1

.00010.00013 90.0

.00015.00020 90.0

.00020.00027 89.9

.00030.00040 89.9

.00040.00053 89.9

.00060.00080 89.8

500.25990-100.6

800.16690-159.3

1000.11400-191.6

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Example XML calibration file

```
<?xml version = '1.0' encoding = 'iso-8859-1'?>
<?xml-stylesheet type="text/css" href="calibration.css"?>
<calibration>
  <calibration_type>
    <calibrated_unit>MFS-06 UW</calibrated_unit>
    <serialnumber>1</serialnumber>
    <ident_string>MFS06001U.TRF</ident_string>
    <comments>this type had an extra plastic shielding</comments>
  </calibration_type>
  <calinfo>
    <comments>possibly 50 Hz values have to be edited manually</comments>
    <equipment>Solartron</equipment>
    <calibration_date_of_equipment>31.03.2002</calibration_date_of_equipment>
    <operator>U. Matzander</operator>
    <calibration_coil>Tube 40x300</calibration_coil>
    <date>12.02.2004</date>
    <location>Magnetsrode, Germany</location>
  </calinfo>
  <columns>
    <needed_columns>3</needed_columns>
    <chopper>on</chopper>
    <unit_col1>f</unit_col1>
    <unit_col2>V/(nT*Hz)</unit_col2>
    <unit_col3>degrees</unit_col3>
    <caldata>
      <c1>+1.0000E-02</c1>
      <c2>+5.0635E-01</c2>
      <c3>+8.9246E+01</c3>
    </caldata>
    <caldata>
      <c1>+1.5849E-02</c1>
      <c2>+5.0520E-01</c2>
      <c3>+8.8879E+01</c3>
    </caldata>
    <caldata>
      <c1>+2.5119E-02</c1>
      <c2>+5.0395E-01</c2>
      <c3>+8.8358E+01</c3>
    </caldata>
  </columns>
</calibration>
```

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files can be read with a simple browser (no propriete software needs to be intsalld)

file:///localhost/home/bfriedr/cpp/xml/mfs06_1.xml - Opera 7.51

File Edit View Navigation Bookmarks Mail Chat Tools Window Help

Rewind Back Forward F.Forward Reload

BUY OPERA TODAY!
And make this banner go away.

OPERA software

Super search DealTime search Amazon.com search

New page file:///localhost/home/... Blank page

Search

Bookmarks

Mail

Contacts

Chat

Notes

Transfers

History

Links

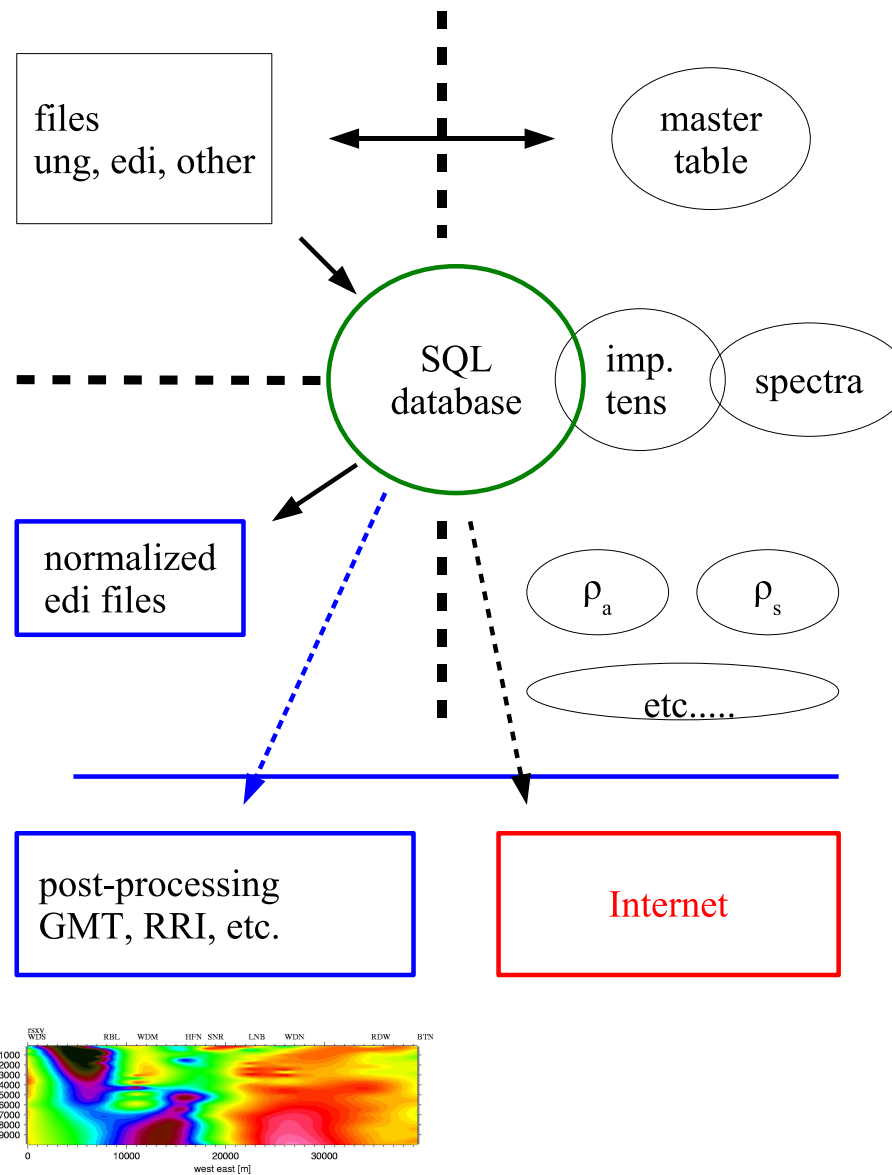
Windows

file:///localhost/home/ Google search 100%

Calibrated Unit: MFS-06 UW
SerialNumber: 1
expected name: MFS06001U.TRF
Comment: this type had an extra plastic shielding
Comment: possibly 50 Hz values have to be edited manually
Equipment Solartron (last gauging: 31.03.2002) Operator: U. Matzander Calibration Coil: Tube 40x300
Calibration Date: 12.02.2004
Location: Magnetsrode, Germany columns: 3
Chopper: on

f	V/(nT*Hz)	degrees
+1.0000E-02	+5.0635E-01	+8.9246E+01
+1.5849E-02	+5.0520E-01	+8.8879E+01
+2.5119E-02	+5.0395E-01	+8.8358E+01
+3.9811E-02	+5.0350E-01	+8.7437E+01
+6.3096E-02	+5.0299E-01	+8.5972E+01
+1.0000E-01	+5.0138E-01	+8.3695E+01
+1.5849E-01	+4.9834E-01	+8.0297E+01
+2.5119E-01	+4.8752E-01	+7.4609E+01
+3.9811E-01	+4.6876E-01	+6.6846E+01
+6.3096E-01	+4.2256E-01	+5.4671E+01
+1.0000E+00	+3.5703E-01	+3.9602E+01
+1.5849E+00	+2.6801E-01	+2.1837E+01
+2.5119E+00	+1.8265E-01	+7.0704E+00
+3.9811E+00	+1.1525E-01	-8.8552E+00
+6.3096E+00	+6.7317E-02	-2.5291E+01
+1.5849E+01	+1.7336E-02	-5.9044E+01
+2.5119E+01	+7.7039E-03	-7.4319E+01
+3.9811E+01	+3.2332E-03	-8.8850E+01
+6.3096E+01	+1.3209E-03	-1.0398E+02
+1.0000E+02	+5.1345E-04	-1.2352E+02

Solution for the files acquired from 1993 to 2004



same technology (XML-> SQL DB -> Internet) will be also used for the next data logger generation

Data access - html

2004-10-15

file:/doc/Geophysics/hyderabad/talk/html_exmpl/l.html

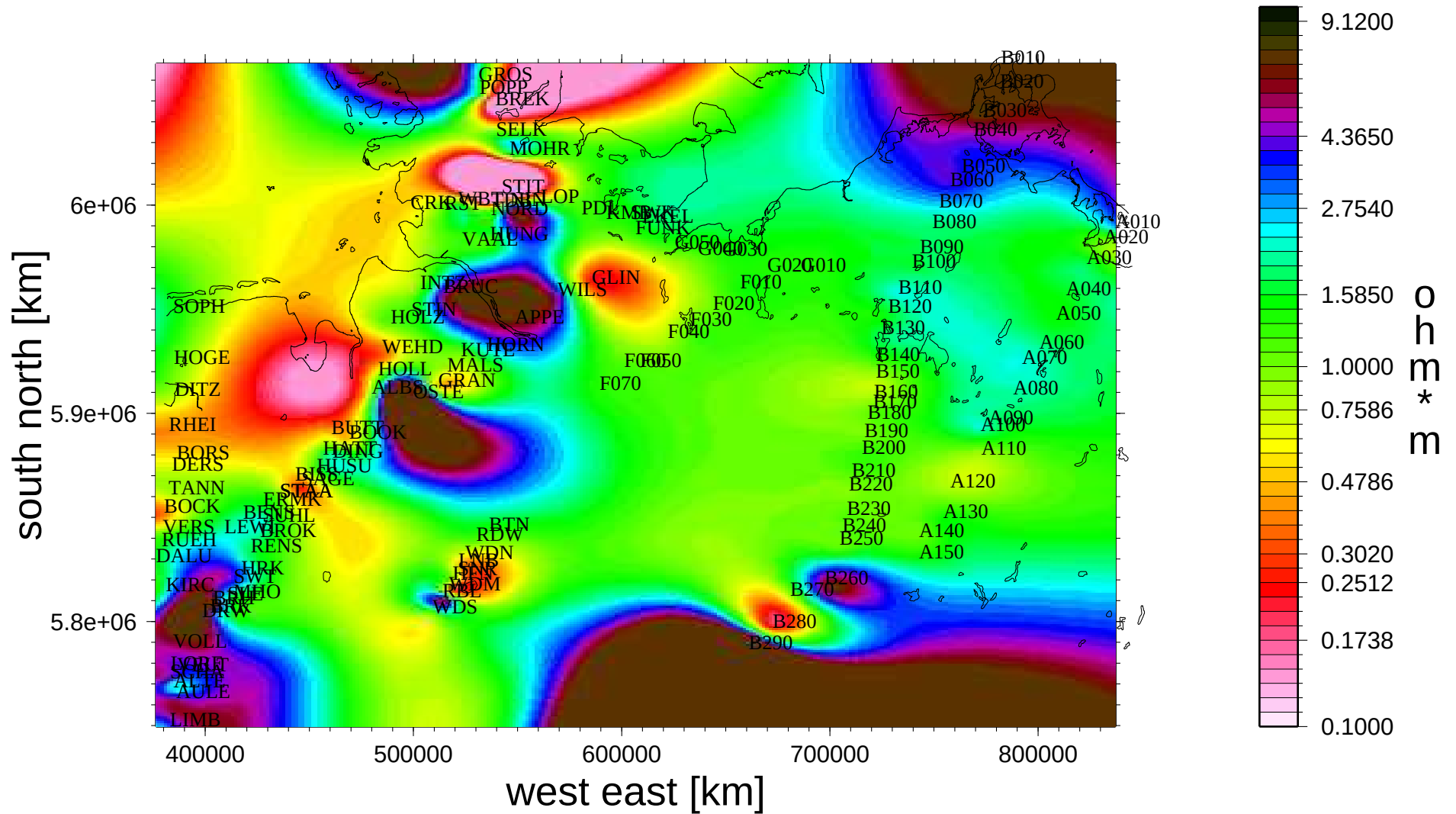
#1

idx	refloc	refabb	reflat	reflong	refelev	file	profile	newediname
140	Büchten	BTN	52:44:45.30	09:32:19.70	0	BTN.edi	L	L_BTN.edi
225	Häfern	HFN	52:31:40.20	09:16:43.80	0	HFN.edi	L	L_HFN.edi
260	Linsburg	LNB	52:35:02.30	09:19:10.80	0	LNB.edi	L	L_LNB.edi
278	Rehburg-Loccum	RBL	52:27:41.90	09:12:16.60	0	RBL.edi	L	L_RBL.edi
280	Rodewald	RDW	52:41:09.60	09:26:50.20	0	RDW.edi	L	L_RDW.edi
286	Schneeren	SNR	52:32:51.30	09:18:56.40	0	SNR.edi	L	L_SNR.edi
303	Wildes Moor	WDM	52:29:47.60	09:15:06.00	0	WDM.edi	L	L_WDM.edi
304	Wenden	WDN	52:37:46.60	09:22:07.70	0	WDN.edi	L	L_WDN.edi
305	Wiedensahl	WDS	52:23:01.50	09:08:08.50	0	WDS.edi	L	L_WDS.edi

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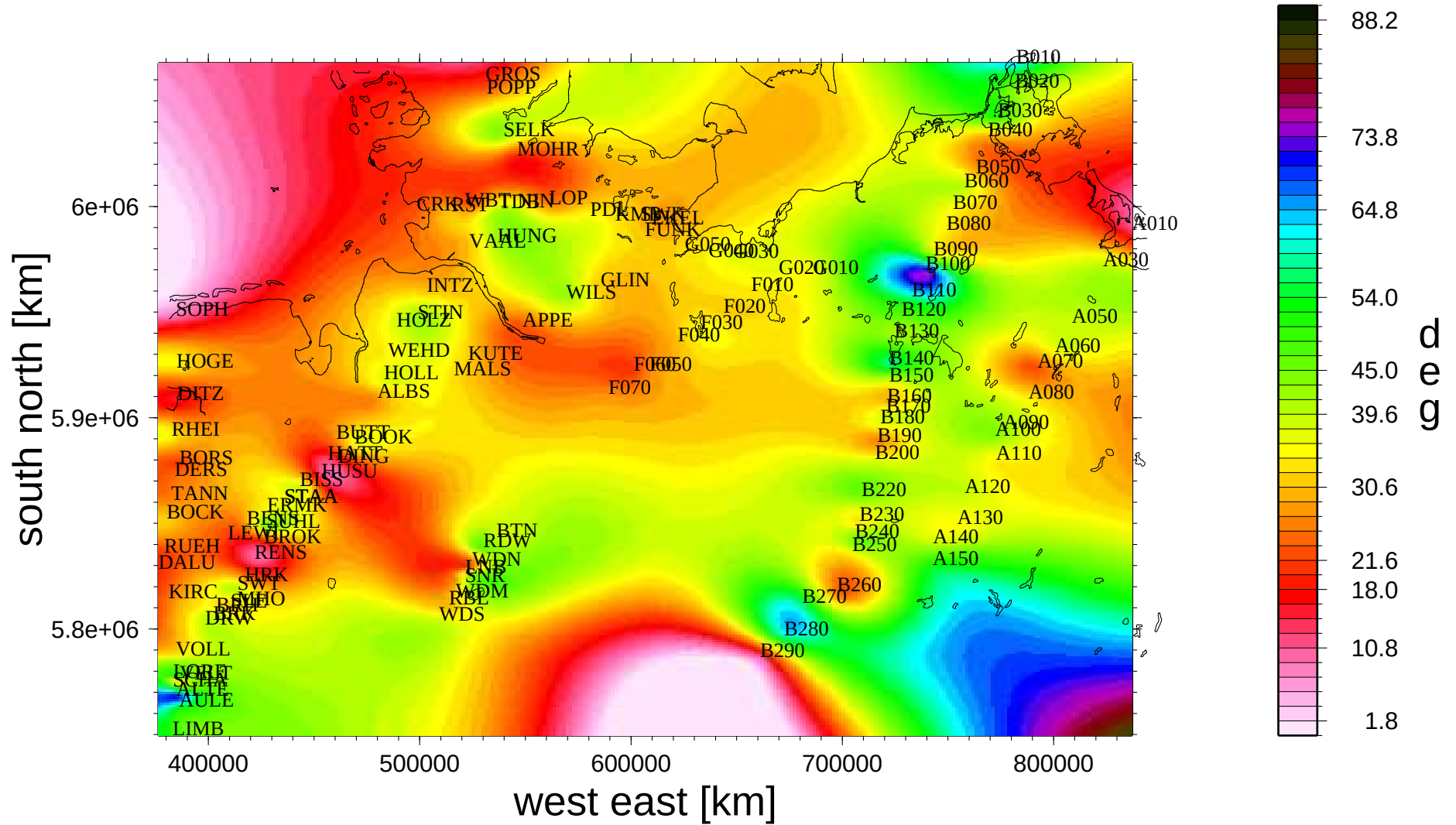
Data access - plan view 124s

Northern Germany ρ_{axy} 124s, Swift rotated



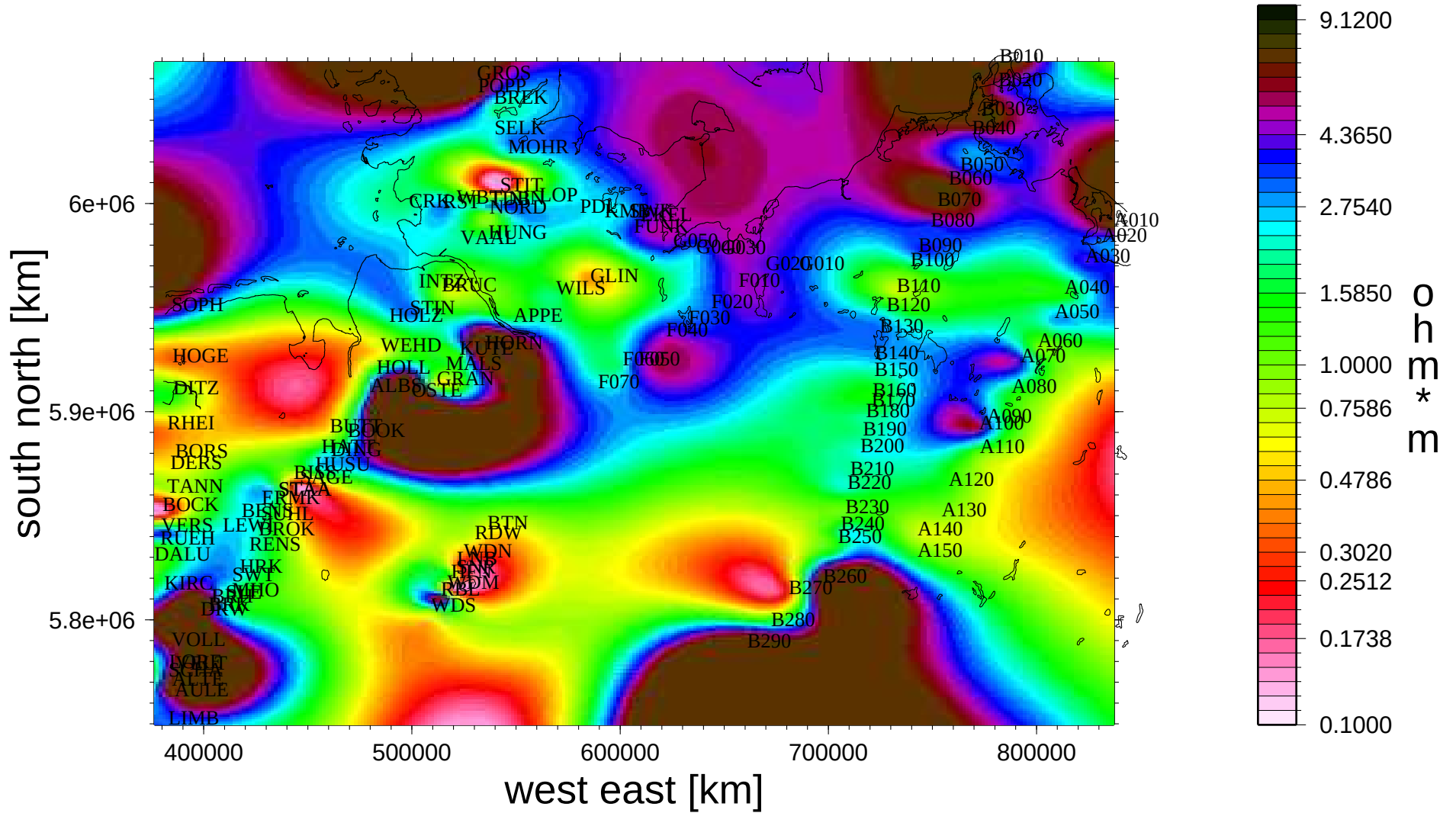
Data access - plan view 1024s

Northern Germany ϕ_{xy} 1024s, Swift rotated



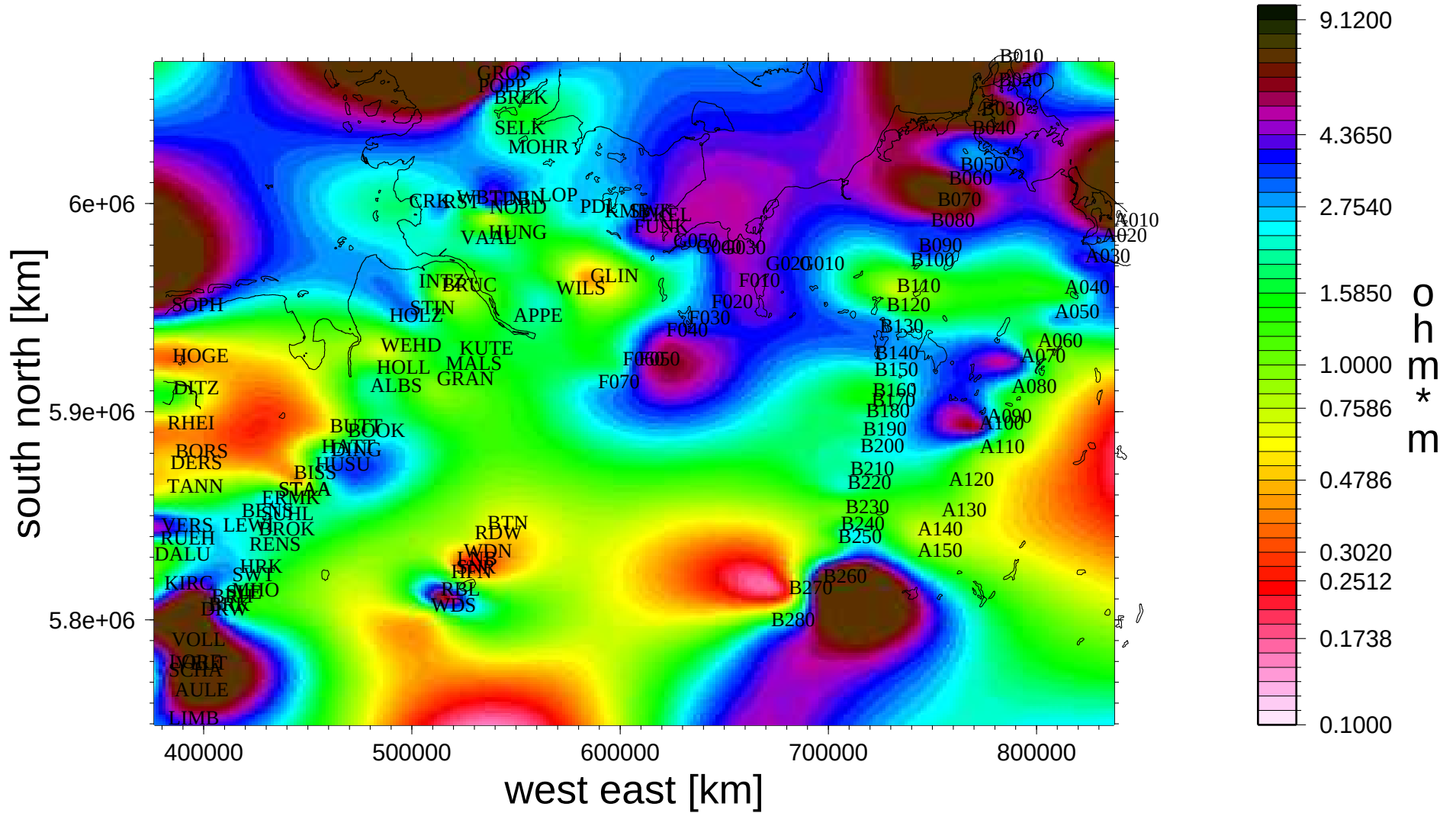
Data access - plan view 1024s

Northern Germany ρ_{axy} 1024s, Swift rotated

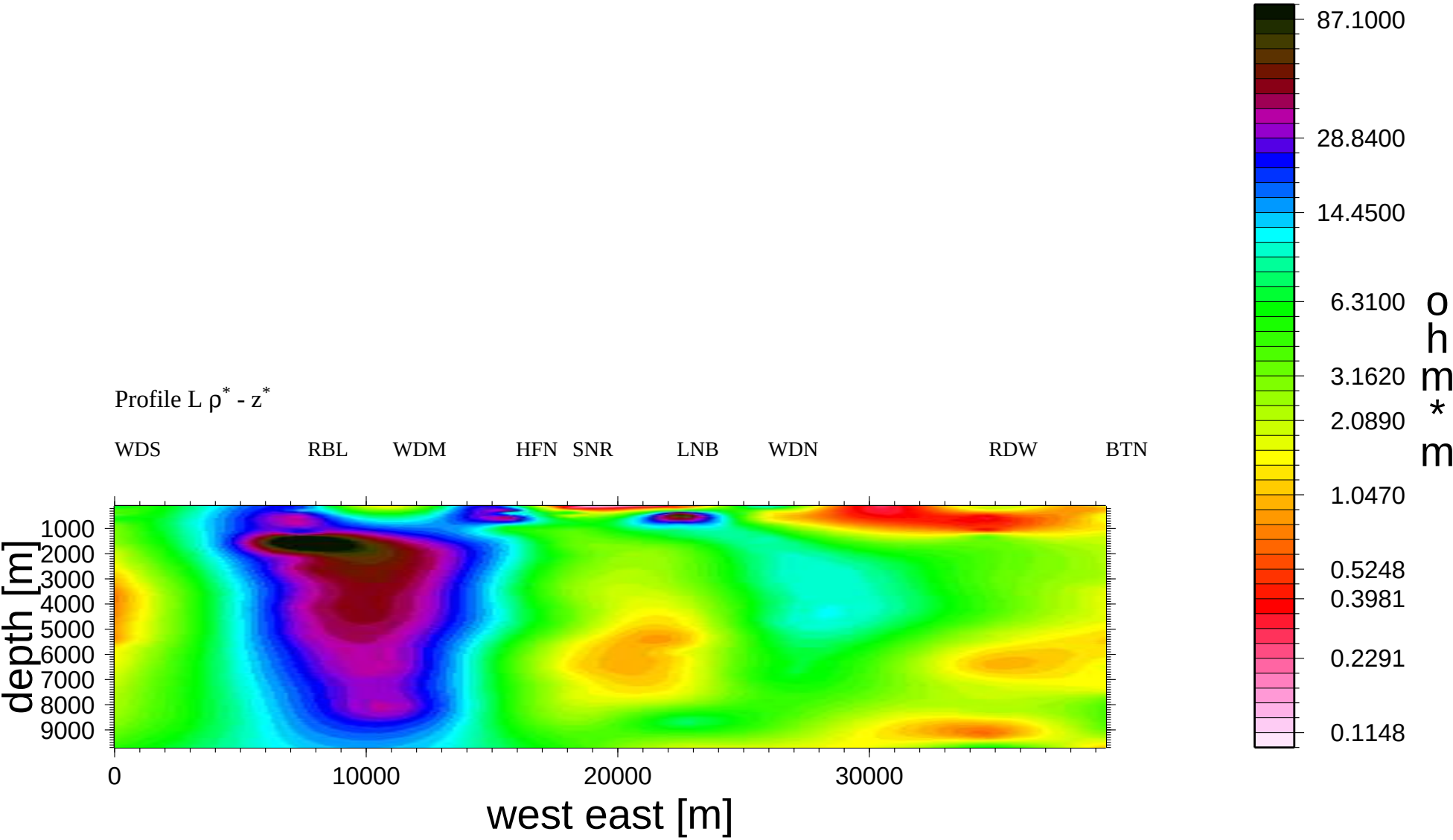


Data access - plan view 1024s

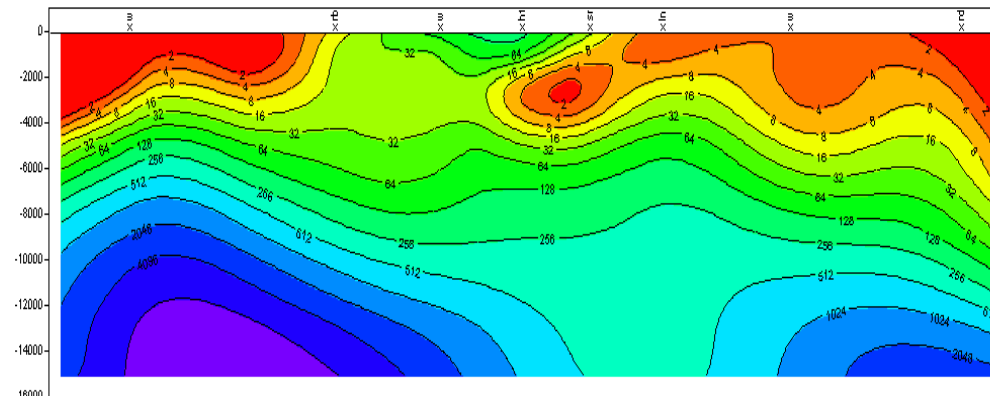
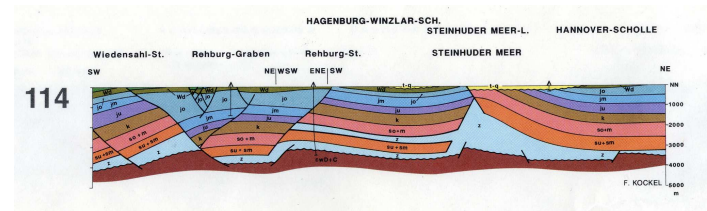
Northern Germany ρ_{axy} 1024s, Swift rotated, $\Delta\rho < 20\Omega\text{m}$



Data access - profile L



First data from 2004



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Conclusion

- after 10 years of measuring profiles this is the first attempt of a lateral interpretation of the soundings
- results are looking promising and showing points of new interest - especially where we should measure in the future
- data access could be solved by using a SQL data base which runs on a single computer but can be accessed from anywhere
- geological interpretation can be seen on the poster of **N. Hoffmann, BGR**, Germany in the poster section